



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/925,592	08/09/2001	Ralph E. Sipple	RA-5416	5422

27276 7590 06/09/2004

UNISYS CORPORATION
UNISYS WAY
MAILSTOP E8-114
BLUE BELL, PA 19424-0001

EXAMINER

KNOLL, CLIFFORD H

ART UNIT	PAPER NUMBER
2112	6

DATE MAILED: 06/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/925,592	SIPPLE ET AL.	
	Examiner	Art Unit	
	Clifford H Knoll	2112	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 March 2004.
 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) ☐ Claim(s) _____ is/are allowed.
 6) ☒ Claim(s) 1-4, 8-16, and 18-20 is/are rejected.
 7) ☒ Claim(s) 5-7 and 17 is/are objected to.
 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 2112

DETAILED ACTION

This Office Action is responsive to communication filed 3/30/04. Currently claims 1-20 are pending.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4 and 8-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Vartti (US 5678026).

Regarding claim 1, Vartti discloses inquiry generator for generating signals containing either CSWL requests or status reports (e.g., col. 7, line 1-3, "M1") and providing, interpreting and receiving such inquiries and reports to/from another mid-level cache side door (e.g., col. 6, lines 45-47), CSWL cache memory for storing CSWLs to which the cache is mapped, and means for determining if a CSWL subject to the inquiry is present, and determining and processing the inquiry and generating a response, and a circuit for responding to a requesting local processor with the status received from a status report (e.g., col. 6, lines 63-66).

Art Unit: 2112

Regarding claim 2, Vartti also discloses the inquiry processor is the said means of part "d" (e.g., Figure 2).

Regarding claim 3, Vartti also discloses the inquiry processor has the comparator circuit (e.g., Figure 4).

Regarding claim 4, Vartti also discloses a CSWL map directory containing addresses for each CSWL to which said associated mid-level cache is mapped and determining whether an inquiry is mapped to the cache (e.g., Figure 4).

Regarding claim 8, Vartti also discloses a status stripper circuit fashioning a signal from a status field in a CSWL after processing by the inquiry processor to supply information needed to provide a reply to said CSWL inquiry (e.g., col. 6, lines 64-66).

Regarding claim 9, Vartti also discloses a circuit for receiving the inquiries and status reports from other non-associated mid-level caches having similar circuit apparatus to said claim 1 circuit apparatus through which to communicate with said other non-associated mid-level caches said similar circuit apparatuses (e.g., col. 7, lines 20-28).

Regarding claim 10, Vartti also discloses an internal data channel (e.g., Figure 4).

Regarding claim 11, Vartti also discloses the lock cache access having lower priority than the data cache access (e.g., col. 7, lines 37-43).

Regarding claim 12, Vartti also discloses mid-level caches connected through said side door to side doors in each non-associated mid-level caches, wherein a radial communications pathway joins all such side doors (e.g., Figure 1).

Art Unit: 2112

Regarding claim 13, Vartti also discloses the radial is a bus and the connection is a side door programmed to respond only to mapped CSWLs appearing on the bus (e.g., col. 7, lines 56-65).

Regarding claim 14, Vartti also discloses the radial is a crossbar and the connections are configured by mapping of said CSWLs such that a given CSWL will map to a unique mid-level cache (e.g., col. 7, lines 45-54).

Thus are claims 1-4, 8-14 rejected.

Claims 15-16, 18-20 stand rejected under 35 U.S.C. 102(e) as being anticipated by Arimilli (US 6625701).

Regarding claim 15, Arimilli discloses receiving and interpreting a request (e.g., col. 5, line 67 – col. 6, line 3), if CSWL is in a storage circuit either setting the CSWL and returning an ownership indicia or returning the status to the requester (e.g., col. 7, lines 16-19), or if said CSWL is not in a storage circuit within associated mid-level cache forming a data request to retrieve and receiving the requested CSWL from a current owner (e.g., col. 7, lines 49-53), and if the lock request does not relate to a CSWL, passing the lock request as ordinary data within said the computer system (e.g., col. 7, lines 8-10).

Regarding claim 16, Arimilli also discloses where step C is performed by the receiving controller and the requested CSWL is retained by the associated mid-level cache (e.g., col. 7, lines 18-19).

Art Unit: 2112

Regarding claim 18, Arimilli also discloses setting a flag indicator by a processor to indicate that a software lock request is a CSWL request and recognizing the flag indicator by the receiving controller (e.g., col. 7, lines 14-15).

Regarding claim 19, Arimilli also discloses where step C will be performed after other functions (e.g., col.7, lines 31-35).

Regarding claim 20, Arimilli also discloses where the prioritizing step C to be performed at a lower priority than other functions on an interleaved basis (e.g., col. 7, lines 49-50).

Thus claims 15-16, 18-20 stand rejected.

Response to Arguments

Applicant's arguments with respect to claims 1-4, 8-14 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments filed 3/30/04 with respect to claims 15-16, 18-20 have been fully considered but they are not persuasive.

Applicant argues that "since all of the claims rely on a side door mechanism, separate and apart from the normal data pathways for communicating directly among themed-level caches and non of the references cited contain this feature" (p. 9). Applicant states that the "side door/radial communication system of the applicant's invention is a radical departure from normal data pathways in multiprocessor computer systems where normally there is a system bus through which all software locks pass. In the applicant's system there is an additional pathway, the radial, that has either an

Art Unit: 2112

additional set of hardware controllers or added features to a standard set of hardware controllers to make it work, and it is above and beyond the ordinary communications pathways and system buses that other multiprocessor computer systems use" (p. 9). Applicant cites enabling support on page 20 of the specification. Although there is no structural recitation supporting a separate pathway, Examiner accepts Applicant's particular use of the terminology "side door" as pertaining to an "additional pathway" that is "above and beyond the ordinary communication pathways and system buses that other multiprocessor computer systems use". Recitation of "side door" is deemed drawn to all the equivalents of bus "R" shown, for example, in Figures 4 and 5. In light of this interpretation, as supported by amendatory recitation, Examiner withdraws rejection of claims 1-14 because Arimilli discloses use of the central bus in his communal lock system.

Of the remaining claims only claim 17 recites the side door. Therefore, the rejection of claims 14-16 and 18-20 is maintained.

Allowable Subject Matter

Claims 5-7 and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Art Unit: 2112

While Vartti discloses the side door and the various limitations recited in other claims, Vartti fails to disclose determination that "a CSWL inquiry is not mapped to said associated mid-level cache but is mapped to said non-associated mid-level cache" and as a result, "generating an inter-mid-level cache lock request". In Vartti, no such determination is made, and instead the lock request is sent simultaneously to all mid-level caches, associated, and non-associated. Similar unanticipated recitation is seen in claim 6 and in claim 17 (in parent claim 15). Claim 7 is seen to depend on claim 5. Therefore, it is determined that claims 5-7 and 17 recite allowable subject matter.

Other prior art fails to teach the invention as claimed, which recites the side door bus or its equivalents as defined by Applicant in his arguments (as noted supra in Response to Arguments).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

Art Unit: 2112

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Clifford H Knoll whose telephone number is 703-305-8656. The examiner can normally be reached on M-F 0630-1500.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark H Rinehart can be reached on 703-305-4815. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

chk



MARK H. RINEHART
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100